

IV. ANY ALLOCATION FOR UNLICENSED DEVICES SHOULD INCLUDE NECESSARY LIMITATIONS TO ENSURE LOW-POWER, NON-INTERFERING OPERATIONS.

Many of the opening comments maintain that allocation of at least 1910-1930 MHz for unlicensed devices is both necessary and appropriate.¹³¹ The 1910-1930 MHz band was originally proposed for unlicensed devices by the Commission because of the lower density of existing fixed microwave users present. Such an allocation would allow manufacturers to offer to the public end-user devices, including wireless PBXs and data networks.

If the Commission allocates this spectrum for unlicensed devices, however, GTE is concerned that the proposed power limits may be too high to ensure non-interfering operation. GTE submits that lower power limits, as suggested by numerous other commenters, may be more appropriate.¹³²

¹³¹ APC at 6; AT&T at 14; Ameritech at 12; Andrew Corporation ("Andrew") at 6, 8-9; Apple Computer, Inc. ("Apple") at 3; Bell Atlantic at 39; BellSouth at 24-26; California Microwave, Inc. at 2; Centel at 13; Domestic Automation Company at 4-6; Ericsson at 21; Harris Corporation-Farion Division at 2; Hewlett-Packard Company at 2; Hitachi Telecom (USA), Inc. at 2-3; Hughes at 6; IEEE Project 802 at 7; Interdigital at 10-11; Knowledge Implementations, Inc. at 3-4; Matsushita Communications Industrial Corporation of America at 5-6; McCaw at 12-13; Metrocall at 5-6; Motorola, Inc. ("Motorola") at 9; Northern Telecom at 22; Omnipoint at 11-12; Pacific Communication Sciences, Inc. at 14; PerTel at 2; Rolm at 16-19; Rose Communications, Inc. at 6; Chandos A. Rypinski at 2; SCTA at 3; Spectralink Corporation ("Spectralink") at 3-4; Tadiran at 11-12; Tandy Corporation at 8; Teknekron Communications Systems, Inc. at 2; TIA Mobile Communications Division at 6; Telocator at 3; USSBA at 14; USTA at 31; UTC at 23; WINForum at 6-7; Xircom Corporation ("Xircom") at 2.

¹³² Motorola at 27; Rose at 11; Spectralink at 6; Xircom at 4.

Motorola, Rose Communications, Spectralink, and Xircom, in fact, have all proposed generally consistent lower power limits that appear to be derived from a formula that more sensibly relates the maximum power (P_{max} Watts) to the bandwidth (f_{BW} Hertz):

$$P_{max} = \sqrt{f_{BW}} \times 10^{-4}$$

GTE believes power limits based upon this formula would better ensure that unlicensed devices do not cause interference.

V. THE COMMISSION STILL MUST ADDRESS FUNDAMENTAL ISSUES CONCERNING THE DEMAND FOR PCS AND ITS ROLE IN THE NATION'S FUTURE TELECOMMUNICATIONS INFRASTRUCTURE.

In its initial comments, GTE highlighted several basic, fundamental issues unaddressed by the Notice. First, GTE noted that the Notice proposed to allocate tremendous theoretical capacity for new services in the absence of any statistically-reliable evidence on potential demand.¹³³ Second, the Notice failed to appraise how to integrate new services to best strengthen the nation's telecommunications infrastructure, which includes existing telephone, cellular, and cable networks.¹³⁴ Third, PCS could

¹³³ GTE Comments at 5-12.

¹³⁴ Id. at 13-22.

impact mandated support mechanisms designed to promote, inter alia, universal service.¹³⁵

In light of the opening comments, it is essential for the Commission to consider these points and to develop a comprehensive plan for the deployment of PCS. As discussed below, deliberate evaluation of these issues at the outset will avoid overestimating PCS, thus risking a failure of United Kingdom proportions. Deliberate pro-active decisions on infrastructure integration will also avoid underestimating PCS, thus maximizing its potential, and reducing the societal costs associated with multiple new under-utilized networks.

A. The Commission Should Proceed Cautiously In The Absence Of Statistically Accurate Information On PCS Demand.

In its initial comments, GTE noted that no statistically rigorous demand studies have justified the immense spectrum allocations -- 100-120 MHz or more -- contemplated for PCS.¹³⁶ This lack of reliable demand information has not been cured in the latest round of comments. Indeed, the few estimates of potential consumer acceptance to date are based on

¹³⁵ Id. at 14-16.

¹³⁶ GTE noted, for example, that the scarce spectrum under consideration has the potential capacity to serve all traffic currently carried on all wireline networks today. Id. at 5 & n.3.

limited technology trials and "best guesses" by interested industry participants. As GTE noted previously, the danger of proceeding on the basis of such studies is evidenced by the failure of PCS to date in the United Kingdom,¹³⁷ and GTE urges the Commission to proceed cautiously.

First, the Commission should realize that equipment trials, while useful to collect technical information, are not tailored to judge demand accurately. These trials often make assessments only on the basis of a single type of PCS implementation, rather than evaluating a broad range of features and functionalities of possible interest to the public. More importantly, these trials have not offered service to a statistically significant population over a statistically significant period of time.

Second, the Commission should understand that the often cited Telocator and Telecommunications Industry Association ("TIA") surveys are not a statistically reliable barometer of potential demand. These surveys represent the collective judgment of trade association PCS members, many of whom are participants in this rulemaking seeking large spectrum

¹³⁷ Id. at 8-9; Comments of GTE Service Corporation at 21-24, GEN Docket No. 90-314 (filed Oct. 1, 1990); GTE Comments at 6-8, ET Docket No. 92-9 (filed June 5, 1992).

allocations for PCS.¹³⁸ In effect, these studies are no more than collective hypotheses on PCS demand, without any statistical rigor.

In fact, GTE's ongoing Florida trials are the only demand study yet conducted that could satisfy the Commission's rules for evidentiary submission of statistical data.¹³⁹ GTE's trials are designed to test, in a statistically projectible manner, the market for pre-defined classes of PCS, including market characteristics, demand for diverse service features, price elasticity, market size, and expected revenues, using a broad sample of the population over an extended timeframe.¹⁴⁰ Such information is absolutely essential for realistic estimates of national demand for PCS.

GTE is a strong proponent of new spectrum allocations for wireless services. GTE is not an advocate, however, of prematurely embarking upon an irrevocable path that could entangle scarce spectrum suitable for mobile applications for many years to come. Under the circumstances, GTE urges

¹³⁸ For example, TIA's Ad Hoc Microcell Committee met four times during the May-July 1990 timeframe with between 12 to 18 individuals from various companies. The purpose of these meetings was to provide initial and general guidelines for PCS. The information gathered, although placed into a report, was not done in a scientific way or pursuant to accepted market research methods. Similarly, a Telocator committee reviewed market demand issues. It was apparent from the meetings of that group that most companies had not conducted scientifically sound demand research. The committee, therefore, undertook a "Delphi" study to address the issues of market size and usage. A "Delphi" report is intended to reflect the opinions of industry leaders concerning a topic. The Telocator survey should be understood to be nothing more and caution must be used in attempting to draw any other conclusions.

¹³⁹ 47 C.F.R. § 1.363 (1991).

¹⁴⁰ GTE's Florida trials were described in its opening comments. GTE Comments at 9-12.

the Commission to act cautiously, without foreclosing future spectrum opportunities, and with sufficient safeguards to ensure that massive spectrum resources are not irreversibly committed to services for which hypothetical demand does not materialize.¹⁴¹

B. The Commission Should Establish Clear Guidelines Delineating The Relationship Between PCS And Existing Communications Networks.

GTE continues to believe that the relationships between PCS and existing communications networks must be resolved prior to the implementation of PCS. As GTE observed in its initial comments, the way that PCS integrates with existing local exchange, cellular, and cable television networks affects the nation's communications infrastructures as a whole. As evidenced by the comments, proceeding in the absence of clear and consistent policy directives defining the prospective roles and relationships of these important infrastructure elements risks limiting, rather than augmenting, future telecommunications options for the public. In

¹⁴¹ One approach the Commission should examine entails a phasing in of the PCS spectrum for use by licensees. Each of the five licensees would initially receive an allocation "scaled down" to adjust for substantiated demand. Spectrum then could be made available at a later time for system expansion, up to a maximum of 20 MHz, in the event additional demand materializes. Such a scheme would be consistent with the approach used in cellular, where carriers were granted access to an "expanded band" when demand exhausted available capacity. Compare Cellular Communications Systems, 86 F.C.C.2d 469, 476 (1981), modified 89 F.C.C.2d 58 (1982), with Cellular Communications Systems, FCC 86-333 (July 24, 1986).

addition, such an approach may jeopardize the financial futures of those charged with providing the telecommunications infrastructures.

1. The Commission must define how PCS will integrate with essential landline telephone services.

Due to its position as a telephone carrier, GTE is particularly concerned about the failure to address the impact of PCS on landline services. The tremendous capacity of PCS networks holds both the promise and the threat of rapidly displacing a significant proportion of the traffic currently carried by wireline networks. The nation's wireline networks, however, interact through complex, regulatory-mandated subsidy programs designed to promote policy goals such as universal service.¹⁴² As the Pennsylvania Public Utility Commission points out, "if PCS is not effectively managed, the LEC local loop network, containing various subsidies which provide universal telephone service, could be jeopardized."¹⁴³ Given the presumed importance of these arrangements, both GTE and the National Association of Regulatory Utility Commissioners ("NARUC") have recognized

¹⁴² GTE's comments documented, for example, a number of ways in which PCS deployment could impact universal service fund obligations, carrier common line charges, intercarrier compensation, and other social pricing mechanisms affecting local exchange rates under state jurisdiction. GTE Comments at 14-20.

¹⁴³ Penn. PUC at 11.

that a comprehensive review of the relevant rules and policies by a Federal-State Joint Board is virtually mandated.¹⁴⁴

In this regard, clear policy decisions on the relationship between PCS and local exchange service also are needed to help resolve other comprehensive issues.¹⁴⁵ For example, the PCS rules are unclear as to whether a mobile phone connected to the inside wiring of a residence is "fixed service," whether a wireless PCS tail connecting the residential inside wiring with LEC facilities is "mobile service," and the extent to which "fixed services" must remain ancillary to "mobile services." Without deciding this issue within the larger context of whether Commission policies should primarily promote PCS bypass of local exchange service or enhance the repertoire of wireless access technologies available, LECs and other PCS providers may pursue service arrangements that will not integrate PCS with the existing public switched telephone network.

¹⁴⁴ In response to the Commission's Notice, NARUC unanimously adopted a resolution that stated, in pertinent part, "WHEREAS, Local exchange competition arising from the provision of PCS by entities other than local exchange carriers may impact existing sources of contribution that support universal services objectives . . . RESOLVED, That the Federal-State Joint Board examine the impact of the FCC's PCS proposals on existing federal and state support mechanisms and consider whether changes may be required to further universal service objectives." NARUC, Resolution on FCC's Notice of Proposed Rulemaking on Personal Communications Services at 2 (adopted Nov. 16, 1992).

¹⁴⁵ Broader considerations such as interconnection requirements, access compensation, and sharing arrangements need to be resolved. These issues are central issues in defining telecommunications service relationships.

2. The Commission must define the role of PCS vis-a-vis cellular service.

GTE and a number of other commenters, including cellular carriers, cable television companies, equipment vendors, new PCS entrants, government agencies, and telephone companies, also have questioned the role of PCS vis-a-vis existing cellular operations.¹⁴⁶ Although aspects of the Commission's proposals appear to promote replication of 800 MHz cellular service in a higher band,¹⁴⁷ it is not clear that this policy most effectively furthers the public interest. The high-power PCS systems contemplated in the Notice, in fact, are inconsistent with the original vision of PCS as a low-power, low-cost microcellular offering serving light-weight, portable consumer handsets.

The inconsistency between the Commission's proposals and PCS as previously conceived and implemented in experiments has led commenters to suggest that the promise of PCS would be substantially diminished if the Commission persists in pursuing cellular comparability as a PCS goal.¹⁴⁸

¹⁴⁶ API at 12; Ameritech at 4; Association of American Railroads ("AAR") at 3; BellSouth at 6-11 & 62-69; CSI at 8-9; Centel at 31-32; Cox at 3-4; Florida Cellular at 15; GTE Comments at 20-22; Lincoln at 4; McCaw at 8-9; NTIA at 4-5; Omnipoint at 7-9; USTA at 5-7.

¹⁴⁷ GTE Comments at 20 (citing NPRM at 5691, 5700-01, 5721).

¹⁴⁸ McCaw at 8-9.

Because high-power and low-power operations may be mutually exclusive,¹⁴⁹ clear and direct resolution of whether the Commission intends to prioritize competition with existing cellular systems or the advent of additional wireless alternatives must guide decisions on numerous other rules.

3. The Commission should clarify the policies underlying cable television entry into PCS.

The role of cable television in PCS also raises legal and policy questions that must be resolved. Cable television companies are intensely interested in pursuing PCS and, indeed, the Commission has implicitly sanctioned such involvement. To date, however, threshold questions of how PCS offered through cable networks will integrate with the other networks remain unresolved.

GTE and others have noted that cable entry into telecommunications implicates legal and regulatory issues arising from the cable television/telephone company cross-ownership ban, policy issues due to the recent cable television re-regulation legislation, and equity concerns inherent in allowing cable companies to deny competitors' and customers' access to

¹⁴⁹ Commenters have indicated that permitting high-power systems may ultimately result in forcing all PCS systems to high-power operations due to the operation of a "Gresham's Law" of interference. Omnipoint at 14; BellSouth at 13-20.

cable facilities used to provide PCS.¹⁵⁰ Indeed, existing and proposed statutes, rules, and policies recognize that cable companies have access to pole attachment rights, network facilities, and, in many cases, a substantial base of cable subscribers. This access implicates special concerns. GTE believes coherent, direct consideration of the fundamental social policies underlying these concerns is necessary.

In summary, the potential impact of PCS on the nation's communications infrastructure raises a number of fundamental threshold questions that must be resolved. GTE urges the Commission to deliberate on the ultimate role of PCS in the network of tomorrow by first answering questions concerning the inter-relationships of PCS with local exchange, cellular, and cable networks. On the one hand, PCS holds the potential to integrate with these networks in a manner promoting the development of the most advanced telecommunications system in the world. On the other hand, if the Commission prematurely commits the country to a regulatory path without consideration of these issues, PCS also has the potential to undermine critical aspects of the nation's communications infrastructure.

¹⁵⁰ See GTE Comments at 22-24; PDM/PCS at 7-8. It is somewhat ironic that the cable television companies have been among the most vehement proponents of policies promoting PCS as a competitor to local exchange service. See, e.g., Comcast at 5-8; Cox at 6 n.7.

VI. CONCLUSION

The record in this proceeding demonstrates that the public interest will best be served by adoption of policies that maximize opportunities for PCS entry. The comments strongly support full participation by all qualified applicants, including cellular and local exchange service providers. Wireless service market participants must be governed by rules and policies promoting regulatory parity. In addition, the Commission must evaluate demand for PCS and the impact of PCS on key elements of the telecommunications infrastructure in order to make necessary, sound decisions about PCS spectrum allocations and licensing policies.

Respectfully submitted,

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